

AMENDMENTS TO THE CLAIMS

This listing of claims will replace all prior versions and listings of claims in the application:

LISTING OF CLAIMS:

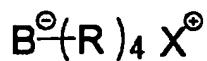
Claims 1-21 (canceled).

22. (currently amended): A photopolymerizable composition comprising:

- (a) a polymerizable compound having an addition-polymerizable unsaturated bond;
- (b) an organic dye; and
- (c) at least one kind of an organoboron compound represented by the following general

formula (I) in a proportion of at least ~~one-four moles of organoboron compound~~ per mole of the organic dye:

General formula (I)



wherein R is selected from the group consisting of an alkyl group, a substituted alkyl group, an aryl group, a substituted aryl group, an aralkyl group, a substituted aralkyl group, an alkaryl group, a substituted alkaryl group, an alkenyl group, a substituted alkenyl group, an alkynyl group, a substituted alkynyl group, an alicyclic group, a substituted alicyclic group, a

heterocyclic group, a substituted heterocyclic group, and a derivative thereof; Rs may be the same as or different from each other; two or more of these groups may join together directly or via a substituent and form a boron-containing heterocycle; and X represents an alkali metal, quaternary ammonium, pyridinium, quinolinium, diazonium, morpholinium, tetrazolium, acridinium, phosphonium, sulfonium, oxosulfonium, iodonium, S, P, Cu, Ag, Hg, Pd, Fe, Co, Sn, Mo, Cr, Ni, As, or Se;

wherein the photopolymerizable composition further includes heat-responsive microcapsules comprising a color-forming component.

23. (previously presented): A photopolymerizable composition according to claim 22, wherein the organic dye is at least one selected from the group consisting of a cationic dye, an anionic dye, and a nonionic dye.

24. (previously presented): A photopolymerizable composition according to claim 22, wherein the polymerizable compound having an addition-polymerizable unsaturated bond is photoreactive and hardens due to photopolymerization.

25. (previously presented): A photopolymerizable composition according to claim 22, wherein the polymerizable compound having an addition-polymerizable unsaturated bond is at least one of a substantially colorless compound having in the molecule thereof a polymerizable group and a site which reacts with a color-forming component so as to develop a color and a

AMENDMENT UNDER 37 C.F.R. § 1.116

U.S. Application No. 09/894,827

Q64663

substantially colorless compound having in the molecule thereof a polymerizable group and a site which inhibits the reaction between a color-forming component and another compound.

26. (currently amended): A photopolymerizable composition comprising:

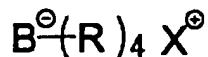
(a) a polymerizable compound having an addition-polymerizable unsaturated bond;

(b) an organic dye; and

(c) at least one kind of an organoboron compound represented by the following general

formula (I) in a proportion of at least one-four moles of organoboron compound per mole of the organic dye:

General formula (I)



wherein R is selected from the group consisting of an alkyl group, a substituted alkyl group, an aryl group, a substituted aryl group, an aralkyl group, a substituted aralkyl group, an alkaryl group, a substituted alkaryl group, an alkenyl group, a substituted alkenyl group, an alkynyl group, a substituted alkynyl group, an alicyclic group, a substituted alicyclic group, a heterocyclic group, a substituted heterocyclic group, and a derivative thereof; Rs may be the same as or different from each other; two or more of these groups may join together directly or via a substituent and form a boron-containing heterocycle; and X represents an alkali metal,

AMENDMENT UNDER 37 C.F.R. § 1.116

U.S. Application No. 09/894,827

Q64663

quaternary ammonium, pyridinium, quinolinium, diazonium, morpholinium, tetrazolium, acridinium, phosphonium, sulfonium, oxosulfonium, iodonium, S, P, Cu, Ag, Hg, Pd, Fe, Co, Sn, Mo, Cr, Ni, As, or Se;

wherein the polymerizable compound having an addition-polymerizable unsaturated bond is at least one of a substantially colorless compound having in the molecule thereof a polymerizable group and a site which reacts with a color-forming component so as to develop a color and a substantially colorless compound having in the molecule thereof a polymerizable group and a site which inhibits the reaction between a color-forming component and another compound.

27. (previously presented): A photopolymerizable composition according to claim 26, wherein the organic dye is at least one selected from the group consisting of a cationic dye, an anionic dye, and a nonionic dye.

28. (previously presented): A photopolymerizable composition according to claim 26, wherein the polymerizable compound having an addition-polymerizable unsaturated bond is photoreactive and hardens due to photopolymerization.

29. (currently amended): A photopolymerizable composition comprising:

- (a) a polymerizable compound having an addition-polymerizable unsaturated bond;
- (b) an organic dye; and

(c) at least one kind of an organoboron compound represented by the following general formula (I) in a proportion of at least one-four moles of organoboron compound per mole of the organic dye:

General formula (I)



wherein R is selected from the group consisting of an alkyl group, a substituted alkyl group, an aryl group, a substituted aryl group, an aralkyl group, a substituted aralkyl group, an alkaryl group, a substituted alkaryl group, an alkenyl group, a substituted alkenyl group, an alkynyl group, a substituted alkynyl group, an alicyclic group, a substituted alicyclic group, a heterocyclic group, a substituted heterocyclic group, and a derivative thereof; R_s may be the same as or different from each other; two or more of these groups may join together directly or via a substituent and form a boron-containing heterocycle; and X represents an alkali metal, quaternary ammonium, pyridinium, quinolinium, diazonium, morpholinium, tetrazolium, acridinium, phosphonium, sulfonium, oxosulfonium, iodonium, S, P, Cu, Ag, Hg, Pd, Fe, Co, Sn, Mo, Cr, Ni, As, or Se;

wherein a recording material prepared by coating on a support a recording layer including the photopolymerizable composition is exposed to light so that the photopolymerizable composition forms a latent image, and heated so that color forming components develop colors

AMENDMENT UNDER 37 C.F.R. § 1.116

U.S. Application No. 09/894,827

Q64663

according to the latent image to form an image, and the recording layer surface is irradiated with light so as to fix the image and decolorize the organic dye.

30. (previously presented): A photopolymerizable composition according to claim 29, wherein the organic dye is at least one selected from the group consisting of a cationic dye, an anionic dye, and a nonionic dye.

31. (previously presented): A photopolymerizable composition according to claim 29, wherein the polymerizable composition further includes heat-responsive microcapsules comprising a color-forming component.

32. (previously presented): A photopolymerizable composition according to claim 29, wherein the polymerizable compound having an addition-polymerizable unsaturated bond is photoreactive and hardens due to photopolymerization.

33. (previously presented): A photopolymerizable composition according to claim 29, wherein the polymerizable compound having an addition-polymerizable unsaturated bond is at least one of a substantially colorless compound having in the molecule thereof a polymerizable group and a site which reacts with a color-forming component so as to develop a color and a substantially colorless compound having in the molecule thereof a polymerizable group and a site which inhibits the reaction between a color-forming component and another compound.

34. (currently amended): A photopolymerizable composition comprising:

- (a) a polymerizable compound having an addition-polymerizable unsaturated bond;
- (b) an organic dye; and
- (c) at least one kind of an organoboron compound represented by the following general

formula (I) in a proportion of at least one-four moles of organoboron compound per mole of the organic dye:

General formula (I)



wherein R is selected from the group consisting of an alkyl group, a substituted alkyl group, an aryl group, a substituted aryl group, an aralkyl group, a substituted aralkyl group, an alkaryl group, a substituted alkaryl group, an alkenyl group, a substituted alkenyl group, an alkynyl group, a substituted alkynyl group, an alicyclic group, a substituted alicyclic group, a heterocyclic group, a substituted heterocyclic group, and a derivative thereof; Rs may be the same as or different from each other; two or more of these groups may join together directly or via a substituent and form a boron-containing heterocycle; and X represents an alkali metal, quaternary ammonium, pyridinium, quinolinium, diazonium, morpholinium, tetrazolium, acridinium, phosphonium, sulfonium, oxosulfonium, iodonium, S, P, Cu, Ag, Hg, Pd, Fe, Co, Sn, Mo, Cr, Ni, As, or Se;

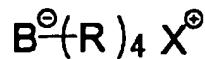
wherein the photopolymerizable composition includes heat-responsive microcapsules including a color-forming component A, and, outside the microcapsules, a substantially colorless compound B having in the molecule thereof a polymerizable group and a site which reacts with the color-forming component A to develop a color, and a photopolymerization initiator comprising the organic dye and the organoboron compound.

35. (currently amended): A photopolymerizable composition comprising:

- (a) a polymerizable compound having an addition-polymerizable unsaturated bond;
- (b) an organic dye; and
- (c) at least one kind of an organoboron compound represented by the following general

formula (I) in a proportion of at least ~~one-four moles of organoboron compound~~ per mole of the organic dye:

General formula (I)



wherein R is selected from the group consisting of an alkyl group, a substituted alkyl group, an aryl group, a substituted aryl group, an aralkyl group, a substituted aralkyl group, an alkaryl group, a substituted alkaryl group, an alkenyl group, a substituted alkenyl group, an alkynyl group, a substituted alkynyl group, an alicyclic group, a substituted alicyclic group, a

AMENDMENT UNDER 37 C.F.R. § 1.116

U.S. Application No. 09/894,827

Q64663

heterocyclic group, a substituted heterocyclic group, and a derivative thereof; Rs may be the same as or different from each other; two or more of these groups may join together directly or via a substituent and form a boron-containing heterocycle; and X represents an alkali metal, quaternary ammonium, pyridinium, quinolinium, diazonium, morpholinium, tetrazolium, acridinium, phosphonium, sulfonium, oxosulfonium, iodonium, S, P, Cu, Ag, Hg, Pd, Fe, Co, Sn, Mo, Cr, Ni, As, or Se;

wherein the photopolymerizable composition includes heat-responsive microcapsules including a color-forming component A, and, outside the microcapsules, a substantially colorless compound C having a site which reacts with the color-forming component A to develop a color, a substantially colorless compound D having in the molecule thereof a polymerizable group and a site which inhibits reaction between the color-forming component A and the compound C, and a photopolymerization initiator comprising the organic dye and the organoboron compound.

36. (currently amended): A recording material comprising a support and at least one recording layer provided thereon which includes a photopolymerizable composition comprising:

(a) a polymerizable compound having an addition-polymerizable unsaturated bond; (b) an organic dye; and (c) at least one kind of an organoboron compound represented by the following general formula (I) in a proportion of at least one-four moles of organoboron compound per mole of the organic dye:

General formula (I)



wherein R is selected from the group consisting of an alkyl group, a substituted alkyl group, an aryl group, a substituted aryl group, an aralkyl group, a substituted aralkyl group, an alkaryl group, a substituted alkaryl group, an alkenyl group, a substituted alkenyl group, an alkynyl group, a substituted alkynyl group, an alicyclic group, a substituted alicyclic group, a heterocyclic group, a substituted heterocyclic group, and a derivative thereof; Rs may be the same as or different from each other; two or more of these groups may join together directly or via a substituent and form a boron-containing heterocycle; and X represents an alkali metal, quaternary ammonium, pyridinium, quinolinium, diazonium, morpholinium, tetrazolium, acridinium, phosphonium, sulfonium, oxosulfonium, iodonium, S, P, Cu, Ag, Hg, Pd, Fe, Co, Sn, Mo, Cr, Ni, As, or Se;

wherein the photopolymerizable composition includes heat-responsive microcapsules including a color-forming component A, and, outside the microcapsules, a substantially colorless compound B having in the molecule thereof a polymerizable group and a site which reacts with the color-forming component A to develop a color, and a photopolymerization initiator comprising the organic dye and the organoboron compound.

37. (previously presented): A recording material according to claim 36, wherein the at least one recording layer comprises a multicolor multilayer recording layer formed by lamination of layers, each of which is adopted for producing a different color.

38. (previously presented): A recording material according to claim 36, wherein the multicolor multilayer recording layer comprises at least one intermediate layer between the recording layers.

39. (previously presented): A recording material according to claim 36, wherein the recording layer includes a protective layer as an outermost layer.

40. (currently amended): A recording material comprising a support and at least one recording layer provided thereon which includes a photopolymerizable composition comprising:
(a) a polymerizable compound having an addition-polymerizable unsaturated bond; (b) an organic dye; and (c) at least one kind of an organoboron compound represented by the following general formula (I) in a proportion of at least ~~one~~four moles of organoboron compound per mole of the organic dye:

General formula (I)



wherein R is selected from the group consisting of an alkyl group, a substituted alkyl group, an aryl group, a substituted aryl group, an aralkyl group, a substituted aralkyl group, an alkaryl group, a substituted alkaryl group, an alkenyl group, a substituted alkenyl group, an alkynyl group, a substituted alkynyl group, an alicyclic group, a substituted alicyclic group, a heterocyclic group, a substituted heterocyclic group, and a derivative thereof; Rs may be the same as or different from each other; two or more of these groups may join together directly or via a substituent and form a boron-containing heterocycle; and X represents an alkali metal, quaternary ammonium, pyridinium, quinolinium, diazonium, morpholinium, tetrazolium, acridinium, phosphonium, sulfonium, oxosulfonium, iodonium, S, P, Cu, Ag, Hg, Pd, Fe, Co, Sn, Mo, Cr, Ni, As, or Se;

wherein the photopolymerizable composition includes heat-responsive microcapsules enclosing a color-forming component A, and, outside the microcapsules, a substantially colorless compound C having a site which reacts with the color-forming component A to develop a color, a substantially colorless compound D having in the molecule thereof a polymerizable group and a site which inhibits reaction between the color-forming component A and the compound C, and a photopolymerization initiator comprising the organic dye and the organoboron compound.

AMENDMENT UNDER 37 C.F.R. § 1.116

U.S. Application No. 09/894,827

Q64663

41. (previously presented): A recording material according to claim 40, wherein the at least one recording layer comprises a multicolor multilayer recording layer formed by lamination of layers, each of which is adopted for producing a different color.

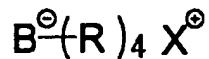
42. (previously presented): A recording material according to claim 40, wherein the multicolor multilayer recording layer comprises at least one intermediate layer between the recording layers.

43. (previously presented): A recording material according to claim 40, wherein the recording layer includes a protective layer as an outermost layer.

44. (currently amended): An image-recording process comprising the steps of:

(a) preparing a recording material by laminating at least one recording layer on a support, with the at least one recording layer including a photopolymerizable composition comprising (i) a polymerizable compound including an addition-polymerizable unsaturated bond, (ii) an organic dye, and (iii) at least one kind of an organoboron compound represented by the following general formula (I) in a proportion of at least one-four moles of organoboron compound per mole of the organic dye

General formula (I)



wherein R is selected from the group consisting of an alkyl group, a substituted alkyl group, an aryl group, a substituted aryl group, an aralkyl group, a substituted aralkyl group, an alkaryl group, a substituted alkaryl group, an alkenyl group, a substituted alkenyl group, an alkynyl group, a substituted alkynyl group, an alicyclic group, a substituted alicyclic group, a heterocyclic group, a substituted heterocyclic group, and a derivative thereof; Rs may be the same as or different from each other; two or more of these groups may join together directly or via a substituent and form a boron-containing heterocycle; and X represents an alkali metal, quaternary ammonium, pyridinium, quinolinium, diazonium, morpholinium, tetrazolium, acridinium, phosphonium, sulfonium, oxosulfonium, iodonium, S, P, Cu, A Hg, Pd, Fe, Co, Sn, Mo, Cr, Ni, As, or Se;

- (b) exposing the recording layer image-wise to light at least once using at least one light source so that the photopolymerizable composition forms a latent image;
- (c) heating the recording material so that the color-forming components develop colors according to the latent image to form an image; and
- (d) irradiating the recording layer surface with light so as to fix the image formed and decolorize the organic dyes;

wherein the step of preparing a recording material includes providing microcapsules comprising a color-forming component in at least one recording layer.

AMENDMENT UNDER 37 C.F.R. § 1.116

U.S. Application No. 09/894,827

Q64663

45. (previously presented): An image-recording process according to claim 44, wherein the step of exposing includes using a plurality of light sources of different wavelengths.

46. (previously presented): An image-recording process according to claim 44, wherein the step of preparing a recording material includes laminating a plurality of recording layers on the support, with the recording layers being sensitive to light of different wavelength from one another.